

What Is Claimed Is:

1           1. A manufacturing method for an electron-emitting source  
2 of triode structure, comprising the steps of:

3           forming a cathode layer on a substrate;

4           forming a dielectric layer on the cathode layer, and  
5 positioning an opening in the dielectric layer to expose the  
6 cathode layer, wherein the opening has a surrounding region;

7           forming a gate layer on the dielectric layer, except on the  
8 surrounding region;

9           forming a hydrophilic layer in the opening;

10          forming a hydrophobic layer on the gate layer and the  
11 surrounding region, wherein the hydrophobic layer contacts the  
12 ends of the hydrophilic layer;

13          dispersing a carbon nanotube solution on the hydrophilic  
14 layer using ink jet printing; and

15          executing a thermal process step, and removing the  
16 hydrophobic layer.

1           2. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 1, wherein the  
3 substrate is made of glass.

1           3. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 1, wherein the  
3 cathode layer is composed of electric conductors.

1           4. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 3, wherein the  
3 electric conductor is silver.

1           5. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 1, wherein the  
3 gate layer is composed of electric conductors.

1           6. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 5, wherein the  
3 electric conductor is silver.

1           7. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 1, wherein the  
3 hydrophobic layer is composed of hydrophobic materials.

1           8. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 1, wherein the  
3 thermal process step is a sintering step.

1           9. A manufacturing method for an electron-emitting source  
2 of triode structure, comprising the steps of:

3           forming a cathode layer on a substrate;

4           forming a dielectric layer on the cathode layer, and  
5 positioning an opening in the dielectric layer to expose the  
6 cathode layer, wherein the opening has a surrounding region;

7           forming a gate layer on the dielectric layer, except on the  
8 surrounding region;

9           forming a sacrificial layer on the gate layer and the  
10 surrounding region, wherein the opening and the cathode layer  
11 are exposed;

12          dispersing a carbon nanotube solution in the opening using  
13 screen printing; and

14        executing a thermal process step, and removing the  
15        sacrificial layer.

1        10. The manufacturing method for an electron-emitting  
2        source of triode structure as claimed in claim 9, wherein the  
3        substrate is made of glass.

1        11. The manufacturing method for an electron-emitting  
2        source of triode structure as claimed in claim 9, wherein the  
3        cathode layer is composed of electric conductors.

1        12. The manufacturing method for an electron-emitting  
2        source of triode structure as claimed in claim 11, wherein the  
3        electric conductor is silver.

1        13. The manufacturing method for an electron-emitting  
2        source of triode structure as claimed in claim 9, wherein the  
3        gate layer is composed of electric conductors.

1        14. The manufacturing method for an electron-emitting  
2        source of triode structure as claimed in claim 13, wherein the  
3        electric conductor is silver.

1        15. The manufacturing method for an electron-emitting  
2        source of triode structure as claimed in claim 9, wherein the  
3        sacrificial layer is composed of photosensitive materials,  
4        hydrophilic materials, lipophilic materials, peelable  
5        materials, soluble materials, sinterable materials, or etchable  
6        materials.

1 16. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 9, wherein the  
3 thermal process step is sintering step.

1 17. A manufacturing method for an electron-emitting source  
2 of triode structure, comprising the steps of:

3 forming a cathode layer on a substrate;

4 forming a dielectric layer on the cathode layer, and  
5 positioning an opening in the dielectric layer to expose the  
6 cathode layer, wherein the opening has a surrounding region;

7 forming a gate layer on the dielectric layer, except on the  
8 surrounding region;

9 forming a carbon nanotube photoresist layer on the gate  
10 layer and covering the opening using spin coating, and  
11 patterning the carbon nanotubes photoresist layer in a  
12 predetermined pattern; and

13 executing a thermal process step.

1 18. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 17, wherein the  
3 substrate is made of glass.

1 19. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 17, wherein the  
3 cathode layer is composed of electric conductors.

1 20. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 19, wherein the  
3 electric conductor is silver.

1        21. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 17, wherein the  
3 gate layer is composed of electric conductors.

1        22. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 21, wherein the  
3 electric conductor is silver.

1        23. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 17, wherein the  
3 width of the predetermined pattern is smaller than the width of  
4 the opening.

1        24. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 17, wherein the  
3 thermal process step is an sintering step.

1        25. A manufacturing method for an electron-emitting source  
2 of triode structure, comprising the steps of:

3            forming a cathode layer on a substrate;

4            forming a dielectric layer on the cathode layer, and  
5 positioning an opening in the dielectric layer to expose the  
6 cathode layer, wherein the opening has a surrounding region;

7            forming a gate layer on the dielectric layer, except on the  
8 surrounding region;

9            forming a sacrificial layer on the gate layer and the  
10 surrounding region, wherein the opening is exposed;

11           forming an adhesive layer in the opening;

12           forming a carbon nanotube layer on the adhesive layer using  
13 a electrophoretic deposition step; and

14        executing a thermal process step, and removing the  
15        sacrificial layer.

1           26. The manufacturing method for an electron-emitting  
2        source of triode structure as claimed in claim 25, wherein the  
3        substrate is made of glass.

1           27. The manufacturing method for an electron-emitting  
2        source of triode structure as claimed in claim 25, wherein the  
3        cathode layer is composed of electric conductors.

1           28. The manufacturing method for an electron-emitting  
2        source of triode structure as claimed in claim 27, wherein the  
3        electric conductor is silver.

1           29. The manufacturing method for an electron-emitting  
2        source of triode structure as claimed in claim 25, wherein the  
3        gate layer is composed of electric conductors.

1           30. The manufacturing method for an electron-emitting  
2        source of triode structure as claimed in claim 29, wherein the  
3        electric conductor is silver.

1           31. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 25, wherein the  
3 electrophoretic deposition step is cathode electrophoretic  
4 deposition, anode electrophoretic deposition, or suspending  
5 electrophoretic deposition.

1           32. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 25, wherein the  
3 thermal process step is a sintering step.

1           33. The manufacturing method for an electron-emitting  
2 source of triode structure as claimed in claim 25, wherein the  
3 sacrificial layer is composed of one selected from  
4 photosensitive materials, hydrophilic materials, lipophilic  
5 materials, peelable materials, soluble materials, sinterable  
6 materials, or etchable materials.